

Notes 12/3 - Factoring Trinomials with $a=1$

$$a=1 \begin{cases} ax^2 + bx + c \\ x^2 + bx + c \end{cases}$$

Working forwards:

$$(x + \underline{\quad})(x + \underline{\quad})$$

$$x^2 + \underline{\quad}x + \underline{\quad}x + \underline{\quad}$$

✓
Combine like terms

$$x^2 + bx + c$$

	x	
x	x^2	$-x$
$-$	$-x$	$-$

FACTORING = working backwards (UNFOILING)

Shortcut: To factor, you need 2 numbers whose product is c ($a \cdot c$, but $1 \cdot c = c$) and whose sum is b .

Ex 1: Factor $x^2 + 11x + 30$

Need $\begin{array}{r|l} a \cdot c & b \\ \hline 30 & 11 \\ \hline 5, 6 & 11 \checkmark \end{array}$

$$(x + 5)(x + 6)$$

Check:

	x	5
x	x^2	$5x$
6	$6x$	30

$$x^2 + 5x + 6x + 30$$

$$\checkmark x^2 + 11x + 30 \checkmark$$

Ex 2: Factor $x^2 - 9x - 10$

order
doesn't matter
BUT the sign
on each #
does matter

$$(x - 10)(x + 1) \checkmark$$

$$\text{or } (x + 1)(x - 10) \checkmark$$

$$\text{NOT } (x - 1)(x + 10) \checkmark$$

Need	*a*c	+b
	-10	-9
-10, 1		-9 ✓
-1, 10		9 x

Ex 3: $x^2 + bx + c$
 $x^2 - 4x - 12$

Need	*-12	+ -4
-6, 2		-4 ✓

$$\underline{(x - 6)(x + 2)}$$